

CLAIMS

1. An apparatus for handling pipes, the apparatus comprising a body (2,6,7) having a tapered surface (11,13,14) and at least a first slip (15,17) and a second slip (16,18) slidable on the tapered surface (11,13,14), the apparatus further comprising a slip actuator (40,41) for setting said at least first slip (15,17) and said second slip (16,18) characterised in that said first slip (15,17) and said second slip (16,18) have interengaging elements (37a,38a) therebetween such that upon actuation of said slip actuator (40,41), said first slip (15,17) is set and said second slip (16,18) is set by the interengaging elements (37a,38a) transferring the setting force from the slip actuator (40,41) through said first slip (15,17) to said second slip (16,18).
2. An apparatus as claimed in Claim 1, wherein the interengaging elements comprise an upstand and a recess.
3. An apparatus as claimed in Claim 1 or 2, wherein said first and second slips (15 to 18) each has a pipe engaging surface (39), a top, a bottom, a rear face (19) and two sides.
4. An apparatus as claimed in Claim 3, wherein said interengaging elements (37a,38a) are located on or in at least one of said sides.
- 25 5. An apparatus as claimed in Claim 4, wherein the rear face slides along said tapered surface (11,13,14) of said body.
6. An apparatus as claimed in any preceding claim, wherein said slip actuator (40,41) sets said at least first and second slips (15,17) by moving the at least first and second slips (15,17) down said tapered surface, wherein the interengaging elements allow lateral movement

between the first and second slip.

7. An apparatus as claimed in any preceding claim, wherein the tapered surface (11,13,14) comprises at least two tapered surfaces.

5 8. An apparatus as claimed in any preceding claim, wherein the tapered surface (11,13,14) takes the form of a frusto-conical surface.

9. An apparatus as claimed in Claim 8, wherein the 10 frusto-conical surface (11,13,14) is located on a main body (2) and two doors (6,7).

10. An apparatus as claimed in Claim 9, wherein one of said doors (6,7) comprises a latch (10) and the other of said doors (6,7) comprises a catch (71).

11. An apparatus as claimed in Claim 10, wherein the 15 main body (2) subtends substantially one hundred and eighty degrees and each of the doors (6,7) subtends between seventy-five and ninety degrees.

12. An apparatus as claimed in Claim 9, 10 or 11, wherein said first slip (15,17) is located on the tapered 20 surface (11) of said main body (2) and said second slip (16,18) is located on the tapered surface of one of said doors (6,7).

13. An apparatus as claimed in any preceding claim, further comprising a third slip (17) and a fourth slip 25 (18) slidable on said tapered surface (11,14), said apparatus further comprising a further slip actuator (41) for setting said at least third slip (17) and said fourth slip (18), wherein said third slip (17) and said fourth slip (18) have interengaging elements therebetween such 30 that upon actuation of said slip actuator (41), said third slip (17) is set and said fourth slip (18) is set by the interengaging elements transferring the setting

force from the slip actuator (41) through said third slip (17) to said fourth slip (18).

14. An apparatus as claimed in any preceding claim, wherein said slip actuator (40,41) is hydraulically actuable.

5 15. In or for use in the apparatus as claimed in any preceding claim, a pair of slips having interengaging elements (37a,38a).

10 16. A slip as claimed in Claim 15, wherein the slip (15 to 18) comprises a plurality of grooves (33,34,35), an insert (36,37,38) arranged in each of said plurality of grooves (33,34,35).

15 17. A slip as claimed in Claim 16, wherein each insert (36,37,38) has a pipe engaging surface (39).

18. A slip as claimed in Claim 15, 16 or 17, having a pipe engaging surface (39), a top, a bottom, a rear face (19) and two sides, said interengaging elements (37a,38a) located on at least one of said sides.

19. A method for setting slips in an apparatus for handling pipes as claimed in any of claims 1 to 14, the method comprising the steps of operating the slips actuating mechanism to apply a setting force to the first slip, whereupon the interengagement means transfers the setting force to the second slip, setting the first and 25 second slips simultaneously.

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20. An apparatus for handling pipes, the apparatus comprising a body (2) with a tapered surface (11,13,14), a recess (26) in the tapered surface and a pin (25) arranged therein, the apparatus further comprising a slip (15 to 18) slideable on the tapered surface, wherein the slip (15 to 18) has a lug (23) slideable on said pin

(25), said slip (15 to 18) biased by resilient means (29,29a) between said body (2) and said lug (23) to bias said slip (15 to 18) into an unset position.

21. An apparatus as claimed in any of Claim 20, further  
5 comprising a shoulder (32) arranged in the path of action  
of the resilient means (29,29a) to inhibit clamping of  
said lug (23) between said resilient means (29,29a) and  
said body (2).

22. An apparatus as claimed in any of Claims 21, further  
10 comprising a sleeve (30) about a portion of said pin (25)  
close to the lug (23), wherein said resilient means  
(29,29a) surrounds said sleeve (30).

23. An apparatus as claimed in Claim 21 and 22, wherein  
said sleeve (30) is fixed to said shoulder (32)

15 24. An apparatus as claimed in any of Claims 20 to 23,  
wherein said body (2) further comprises a lug (27), said  
resilient means (29,29a) biased between said lug (23) of  
said slip (15 to 18) and said lug (27) of said body (2).

25. An apparatus as claimed in Claim 24, wherein said  
20 slip (15 to 18) comprises a further lug (24) arranged  
below said further lug (27) of the body (2).

26. An apparatus as claimed in any of Claims 20 to 25,  
wherein said body (2) comprises a ledge (26) against  
which said lug (23) of said slip (15 to 18) is biased.

25 27. An apparatus as claimed in any of Claims 20 to 26,  
wherein said resilient means comprises at least one of  
the following: pneumatic piston and cylinder, hydraulic  
piston and cylinder and an accumulator, a coiled spring,  
Belville washers, and resilient material such as a foam,  
30 but most preferably a compression spring.

28. A method of changing a slip in an apparatus for  
handling pipes using the apparatus as claimed in any of

claims 20 to 27, the method comprising the steps of removing the pin from said body 2 and moving said slip to slide the lug thereof out of the recess in the body of the apparatus.

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29. A method for indicating slips of an elevator have engaged a pipe, the elevator having a slip actuator for actuating slips to engage a pipe, the slip actuator comprising a hydraulically operated piston and cylinder,  
10 the method comprising the steps of applying pressurised hydraulic fluid to the piston in the piston and cylinder to move the piston to move the slips into engagement with a pipe, the piston passing a signal port, upon which pressurized hydraulic fluid communicates with hydraulic fluid in a line connected to the signal port, which indicates to the controller that the slips are actuated.  
15 30. A method in accordance with claim 29, wherein the elevator further comprises a door and a latch, the door operated by a hydraulic piston and cylinder, the piston and cylinder having a signal port, the method further comprising the step of applying hydraulic fluid under pressure to the piston and cylinder to move the piston to close the door, whereupon the piston passes the signal port, whereupon hydraulic fluid in a line connected to  
20 25 the signal port is pressurised to initiate activation of the latch.

31. A method in accordance with claim 30, wherein the elevator further comprises a hydraulic switch, actuatable upon the latch assuming a closed position, which switch allows hydraulic fluid under pressure to flow therethrough to initiate activation of the slips actuator.  
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32. A method for handling pipe using an elevator having a hydraulic slip actuator for activating slips for engaging a pipe, wherein the elevator further comprises a 5 pilot line, the method comprising the steps of applying pressurized hydraulic fluid to the pilot line to activate the slips actuator to disengage the slips.

33. An apparatus for handling pipes, the apparatus comprising a body, at least one door and a hydraulic slip 10 actuator for activating at least one slip characterised in that said apparatus further comprises a pilot line and a valve for directing flow of hydraulic fluid into said slip actuator to activate the slips actuator to disengage the slips.

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34. An apparatus for handling pipes, the apparatus comprising an elevator (1) having a body (2), at least one ear (3,4), and a slip actuator (40,41) for engaging slips with a pipe said apparatus further comprising a 20 stator (401,403) attachable to bails of a top drive, the apparatus further comprising a rotor (404) attached to said at least one ear (3,4) and drive means (402) for rotating said rotor (404) for tilting said elevator with respect to the stator (401,403).

25 35. An apparatus as claimed in Claim 34, wherein the elevator further comprises at least one door (6,7).

36. A method for handling flush or near flush pipe using an elevator depending from bails of a top drive, the elevator having body and at least one door defining a 30 throat, slips located in the throat and a slip actuator, the method comprising the steps of opening the at least one door of the elevator, tilting the elevator with

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respect to the bails, placing pipe in a throat of the elevator, closing the doors and activating slips to engage the pipe and hoisting the elevator which allows the elevator to assume its initial position with a pipe  
5 depending therefrom.

37. A method in accordance with Claim 36, the elevator further comprising a hydraulically actuatable piston and cylinder for facilitating opening of the door, wherein the method further comprises the steps of opening the doors by raising hydraulic pressure in said actuator, the piston passing a signal port, whereupon a signal is sent which initiates a safety valve which allows the elevator  
10 to be tilted.